

Chapter 2.6 INDIVIDUAL RIVER BASIN DESCRIPTIONS

Potomac and Shenandoah River Basin

The Potomac-Shenandoah River Basin, as its name implies, is made up of the Shenandoah River Subbasin and the Potomac River Subbasin. It occupies the northern portion of Virginia and covers 5,747 square miles or 14 percent of the Commonwealth's total area.

In Virginia, the Potomac-Shenandoah basin is defined by both hydrologic and political boundaries. The basin is bounded by the James River, Rappahannock River, and York River Basins to the west and south. The northern and eastern perimeter of the basin is bounded by the West Virginia and Maryland State lines and the District of Columbia.

The Shenandoah River Subbasin headwaters begin in Augusta County and flow in a northeasterly direction for approximately 100 miles to the West Virginia State line. The basin averages 30 miles in width and covers 2,926 square miles.

The topography of the Shenandoah River Subbasin is characterized by rolling hills and valleys bordered by the Appalachian Mountains to the west and the Blue Ridge Mountains to the east. The Massanutten Mountain Range divides the Shenandoah River into the North and South Forks. Tributaries of the Shenandoah River exhibit steep profiles as they drain the surrounding mountain ridge. The main stems of the Shenandoah exhibit a moderately sloping profile with occasional riffles and pools. 45 percent of the land is forested due to the large amount of federally owned land and the steep topography. Farmland and pasture account for 39 percent of the land area, while 16 percent is urban.

The Potomac River Subbasin headwaters begin in Highland County. The drainage area is 323 square miles for the headwaters. The river then flows in a northeasterly direction through West Virginia and Maryland before joining the Shenandoah at Harper's Ferry, West Virginia. The Potomac continues as the border between Maryland and Virginia, flowing in a southeasterly direction to the Chesapeake Bay 200 miles away. The Potomac River Subbasin ranges in width from 40 miles at its northern locations in Loudoun and Fauquier Counties to less than one mile in Westmoreland County. Approximately 2,821 of the 14,700 square miles of the Potomac River Subbasin drainage area lie in Virginia. The rest covers four states and the District of Columbia.

The topography of the upper Piedmont region of the Potomac River Subbasin is characterized by gently sloping hills and valleys from Harpers Ferry to about 45 miles down river. In the central Piedmont area, the profile is rather flat until it nears the fall line at Great Falls, where the stream elevation rapidly descends from over 200 feet, to sea level. Tributaries in the central Piedmont exhibit moderate and near constant profiles. Streams in the Coastal Plain area are largely characterized by their flat slope. Approximately 40 percent of the Potomac River Basin is forested, 33 percent is farmland and pasture, and an estimated 27 percent is urban.

The 1994 population for the Potomac-Shenandoah River Basin was approximately 1,973,736. The majority of the population resides in urban Virginia surrounding Washington, D.C. All or part of the following jurisdictions lie within the basin: counties - Augusta, Clarke, Frederick, Page, Rockingham, Shenandoah, Stafford, Warren, Highland, Arlington, Fairfax, Loudoun, Prince William, King George, Northumberland, and Westmoreland; cities - Alexandria, Fairfax, Falls Church, Harrisonburg, Staunton, Waynesboro, and Winchester.

The climate of the basin is temperate with extremes occurring in the western, mountainous portions. Average temperature for the basin is 54°F. The average annual precipitation is approximately 39 inches. Annual snowfall ranges from 10 inches in the coastal plain to 35 inches in the mountains.

The Potomac-Shenandoah River Basin is divided into eight USGS hydrologic units as follows: HUC 02070001-South Branch Potomac; HUC 02070004-Conococheague-Opequon; HUC 02070005-South Fork Shenandoah; HUC 02070006-North Fork Shenandoah; HUC 02070007-Shenandoah; HUC 02070008-Upper Middle Potomac; HUC 02070010-Lower Middle Potomac; and HUC 02070011-Lower Potomac. The eight hydrologic units are further divided into 87 waterbodies or watersheds.

Basin assessment information is included in Tables 2.6-1-1, 2.6-1-2, 2.6-1-3.

TABLE 2.6-1-1

POTOMAC-SHENANDOAH RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

Total Size Monitored:			Basin Size			
Use	Water Body Type	Size Fully Supporting	Size Fully Supporting but Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
Aquatic Life	River	1320.39	1,370.74	298.80	21.80	3011.73
	Lake	4,045.70	91.00	0	0	95.045
	Estuary	20.07	27.20	0	0	47.27
Fish Consumption	River	5,471.94	0	129.49	0	5601.43
	Lake	4,136.70	0	0	0	4136.7
	Estuary	58.59	0	0	0	58.59
Shellfishing	River	-	-	-	-	0
	Lake	-	-	-	-	0
	Estuary	24.13	0.77	8.46	0	33.36
Swimming	River	655.15	145.25	280.71	183.30	1264.41
	Lake	4,136.70	0	10.08	0.25	4147.03
	Estuary	46.24	0	0.78	0.25	47.27
Drinking Water	River	160.13	0	5.00	0	165.13
	Lake	3,730.40	0	0	0	3730.4
	Estuary	-	-	-	-	0

TABLE 2.6-1-2 SIZE OF WATERS IMPAIRED BY VARIOUS CAUSE CATEGORIES IN POTOMAC-SHENANDOAH BASIN

Cause of Impairment	Type	Major Impact	Moderate/Minor Impact
General Standards (Benthics)	River (mi)	5.07	91.43
	Lakes (acres)	0	0
	Estuary (mi ²)	0	1.21
PCB'S	River (mi)	0	41.78
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Metals	River (mi)	0	103.40
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
pH	River (mi)	0	0
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Siltation	River (mi)	19.82	104.90
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Organic Enrichment/Low D.O.	River (mi)	20.92	104.90
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Thermal Modification	River (mi)	0	24.43
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Pathogen Indicators	River (mi)	167.17	260.90
	Lakes (acres)	0	0
	Estuary (mi ²)	0.25	7.73
Flow Alterations	River (mi)	0	0
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Habitat Alterations	River (mi)	0	31.48
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Suspended Solids	River (mi)	1.50	0
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0

TABLE 2.6-1-3 SIZE OF WATERS IMPAIRED BY VARIOUS SOURCE CATEGORIES IN POTOMAC SHENANDOAH BASIN

Source of Impairment	Type	Major Impact	Moderate/ Minor Impact
Industrial Point Sources	River (mi)	1.15	5.00
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Municipal Point Sources	River (mi)	1.03	13.12
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Agriculture	River (mi)	141.66	245.22
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Urban Runoff/Storm Sewers	River (mi)	46.09	43.43
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Natural Sources	River (mi)	0	24.43
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Source Unknown	River (mi)	6.25	183.37
	Lakes (acres)	0	0
	Estuary (mi ²)	0.25	0.78
Other Water Quality Standards	River (mi)	0	0
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
VDH Fish Consumption Advisory	River (mi)	0	145.18
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
Collection System Failure	River (mi)	0	21.12
	Lakes (acres)	0	0
	Estuary (mi ²)	0	0
VDH Shellfish Condemnation	River (mi)	0	0
	Lakes (acres)	0	0
	Estuary (mi ²)	0	8.46

